

Claims:

1 1. A route search method for a navigation device, wherein:
2 said navigation device comprises a storage unit that stores
3 link data for each link as a component of roads on a map and
4 statistical data including link travel times obtained by
5 statistically processing traffic information collected previously;
6 and

7 said method comprises:
8 a step of establishing a plurality of route search
9 conditions;

10 a route search step, in which, for each of said plurality of
11 route search conditions, a cost of each link is determined using
12 said link data or said statistical data depending on the route
13 search condition in question, and a route having a smallest total
14 cost for traveling from a departure point to a destination is
15 searched for; and

16 a travel time calculation step, in which an expected travel
17 time for each of a plurality of routes retrieved in said route search
18 step is calculated using said statistical data.

1 2. A route search method according to Claim 1 for a
2 navigation device, wherein:

3 said link data includes a link travel time obtained from
4 map information; and

5 in said route search step, a cost of each link is determined
6 using a link travel time included in said statistical data when a

7 search condition is established in order to perform a search using
8 the statistical data, and a cost of each link is determined using
9 the link travel time included in said link data when a search
10 condition is established in order to perform a search without
11 using the statistical data, and then a route having a smallest
12 total cost for traveling from the departure point to the destination
13 is searched for.

1 3. A route search method according to Claim 1 or 2 for a
2 navigation device, wherein:

3 said link data includes link length information; and
4 in said route search step, a cost of each link is determined
5 using the link length information included in said link data when
6 a search condition is established in order to perform a search
7 giving priority to a travel distance, and then a route having a
8 smallest total cost for traveling from the departure point to the
9 destination is searched for.

1 4. A route search method for a navigation device, wherein:

2 said navigation device comprises a storage unit that stores
3 link data for each link as a component of roads on a map and
4 statistical data including link travel times obtained by
5 statistically processing traffic information collected previously;
6 and

7 said method comprises:

8 a step of establishing a plurality of route search
9 conditions;

10 a route search step, in which a cost of each link is

11 determined using link length information included in said link
12 data when a search condition is established in order to perform a
13 search giving priority to a travel distance, and a cost of each link
14 is determined using a link travel time included in said statistical
15 data when a search condition is established in order to perform a
16 search that gives priority to a travel time and uses the statistical
17 data, and a cost of each link is determined using a link travel
18 time obtained from map information included in said link data
19 when a search condition is established in order to perform a
20 search that gives priority to a travel time and does not use the
21 statistical data, and then a route having a smallest total cost for
22 traveling from a departure point to a destination is searched for;
23 and

24 a travel time calculation step, in which an expected travel
25 time for each of a plurality of routes retrieved in said route search
26 step is calculated using said statistical data.

1 5. A route search method according to one of Claims 1 - 4 for
2 a navigation device, wherein:

3 said link data for each link includes road type information
4 of the link in question; and

5 in said route search step, when a search condition is
6 established in order to perform a route search giving priority to a
7 specific road type, a cost of a link of said specific road type is
8 determined lower in comparison with links of other road types,
9 based on said road type information.

1 6. A route search method according to one of Claims 1 - 5 for

2 a navigation device, wherein:

3 said navigation device displays the expected travel times
4 calculated in said travel time calculation step.

1 7. A route search method for a navigation device, wherein:

2 said navigation device comprises a storage unit that stores
3 link data for each link as a component of roads on a map and
4 statistical data including link travel times obtained by
5 statistically processing traffic information collected previously;

6 said method comprises:

7 a step of establishing a plurality of route search
8 conditions;

9 a route search step, in which a cost of each link is
10 determined using said link data or said statistical data depending
11 on a search condition, and a route having a smallest total cost for
12 traveling from a departure point to a destination is searched for;
13 and

14 a route guidance step, in which route guidance is
15 performed using the route retrieved in said route search step; and
16 an expected travel time used for said route guidance is
17 calculated using said statistical data.

1 8. A route search method for a navigation device, wherein:

2 said navigation device comprises a storage unit that stores
3 link travel times used for calculating an expected travel time for
4 traveling from a departure point to a destination; and

5 said method comprises:

6 a step of establishing a plurality of route search

7 conditions;

8 a route search step, in which, for each of said plurality of
9 route search conditions, a cost of each link is determined
10 depending on the route search condition in question, and a route
11 having a smallest total cost is searched for; and

12 a travel time calculation step, in which an expected travel
13 time for each of a plurality of routes retrieved in said route search
14 step is calculated using the link travel times stored in said
15 storage unit, disregarding said route search condition.

1 9. A route search method according to one of Claims 1 - 7 for
2 a navigation device, wherein:

3 said navigation device performs a receiving step in which
4 selection of use or non-use of the statistical data is received; and

5 when a route search without using the statistical data is
6 selected in said receiving step, then, in said route search step, a
7 route search is performed without using the statistical data, and
8 calculation of said expected travel time is performed using said
9 link data and without using the statistical data.

1 10. A navigation device comprising:

2 a storage unit that stores link data for each link as a
3 component of roads on a map and statistical data including link
4 travel times obtained by statistically processing traffic
5 information collected previously;

6 a search condition establishing means that establishes a
7 plurality of route search conditions;

8 a route search means that determines, for each of said

9 plurality of route search conditions, a cost of each link using said
10 link data or said statistical data depending on the route search
11 condition in question, and searches for a route having a smallest
12 total cost for traveling from a departure point to a destination;
13 and

14 a travel time calculation means that calculates an
15 expected travel time using said statistical data, for each of a
16 plurality of routes retrieved by said route search means.

1 11. A navigation device comprising:

2 a storage unit that stores link data for each link as a
3 component of roads on a map and statistical data including link
4 travel times obtained by statistically processing traffic
5 information collected previously;

6 a search condition establishing means that establishes a
7 plurality of route search conditions;

8 a route search means that:

9 determines a cost of each link using link length
10 information included in said link data when a search condition is
11 established in order to perform a search giving priority to a travel
12 distance;

13 determines a cost of each link using a link travel time
14 included in said statistical data when a search condition is
15 established in order to perform a search that gives priority to a
16 travel time and uses the statistical data;

17 determines a cost of each link using a link travel time
18 obtained from map information included in said link data when a
19 search condition is established in order to perform a search that

20 gives priority to a travel time and does not use the statistical
21 data; and

22 searches for a route having a smallest total cost for
23 traveling from a departure point to a destination; and

24 a travel time calculation means that calculates an
25 expected travel time using said statistical data for each of a
26 plurality of routes retrieved by said route search means.

1 12. A navigation device, wherein:

2 said navigation device comprises:

3 a storage unit that stores link data for each link as a
4 component of roads on a map and statistical data including link
5 travel times obtained by statistically processing traffic
6 information collected previously;

7 a search condition establishing means that establishes a
8 plurality of route search conditions;

9 a route search means that determines a cost of each link
10 using said link data or said statistical data depending on a search
11 condition and searches for a route having a smallest total cost for
12 traveling from a departure point to a destination; and

13 a route guidance means that performs route guidance
14 using the route retrieved by said route search means; and

15 an expected travel time used for said route guidance is
16 calculated using said statistical data.

13. A navigation device comprising:

a storage unit that stores link travel times used for
calculation of an expected travel time for traveling from a

departure point to a destination;

a search condition establishing means that establishes a plurality of route search conditions;

a route search means that determines, for each of said plurality of route search conditions, a cost of each link depending on the route search condition in question, and searches for a route having a smallest total cost; and

a travel time calculation means that calculates an expected travel time using the link travel times stored in said storage unit disregarding said route search condition, for each of a plurality of routes retrieved by said route search means.